



Spatial prediction of *Plasmodium falciparum* prevalence in Somalia

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Abstract:

Background: Maps of malaria distribution are vital for optimal allocation of resources for anti-malarial activities. There is a lack of reliable contemporary malaria maps in endemic countries in sub-Saharan Africa. This problem is particularly acute in low malaria transmission countries such as those located in the horn of Africa. **Methods:** Data from a national malaria cluster sample survey in 2005 and routine cluster surveys in 2007 were assembled for Somalia. Rapid diagnostic tests were used to examine the presence of *Plasmodium falciparum* parasites in finger-prick blood samples obtained from individuals across all age-groups. Bayesian geostatistical models, with environmental and survey covariates, were used to predict continuous maps of malaria prevalence across Somalia and to define the uncertainty associated with the predictions. **Results:** For analyses the country was divided into north and south. In the north, the month of survey, distance to water, precipitation and temperature had no significant association with *P. falciparum* prevalence when spatial correlation was taken into account. In contrast, all the covariates, except distance to water, were significantly associated with parasite prevalence in the south. The inclusion of covariates improved model fit for the south but not for the north. Model precision was highest in the south. The majority of the country had a predicted prevalence of < 5%; areas with $\geq 5\%$ prevalence were predominantly in the south. **Conclusion:** The maps showed that malaria transmission in Somalia varied from hypo- to meso-endemic. However, even after including the selected covariates in the model, there still remained a considerable amount of unexplained spatial variation in parasite prevalence, indicating effects of other factors not captured in the study. Nonetheless the maps presented here provide the best contemporary information on malaria prevalence in Somalia.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2531188>

Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Precipitation, Temperature

Climate Change and Human Health Literature Portal

Temperature: Fluctuations

Geographic Feature: ☒

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Somalia

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content